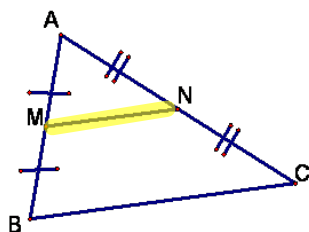
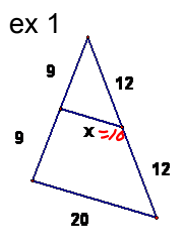
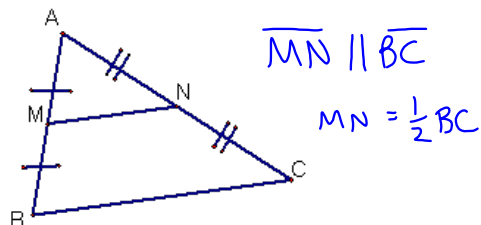


## 5.1 Midsegment Theorem and Coordinate Proof

**Midsegment** of a triangle is a segment whose endpoints are the midpoints of two sides of a triangle.

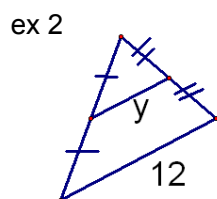


**Theorem 5.1- Midsegment theorem** A midsegment of a triangle is parallel to one side of the triangle, and its length is  $\frac{1}{2}$  the length of that side.



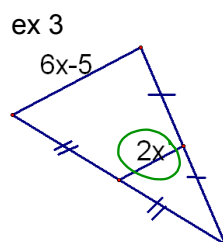
$$x = \frac{1}{2} 20$$

$$x = 10$$



$$y = \frac{1}{2} 12$$

$$y = 6$$

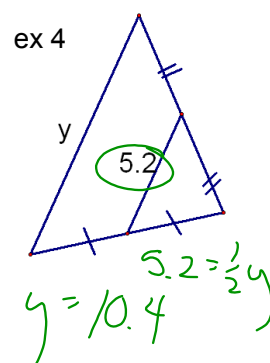


$$2x = \frac{1}{2} (6x - 5)$$

$$4x = 6x - 5$$

$$-2x = -5$$

$$x = \frac{5}{2}$$



$$5.2 = \frac{1}{2} y$$

$$y = 10.4$$

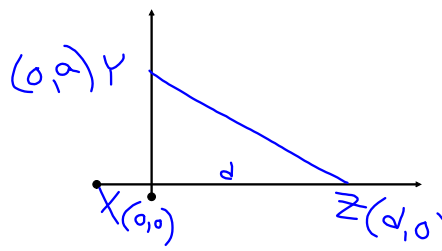
## Coordinate Proof

Tips

1. Use Origin as vertex or center
2. At least one side on x-axis
3. 1st Quadrant if possible
4. Use easiest coordinates possible

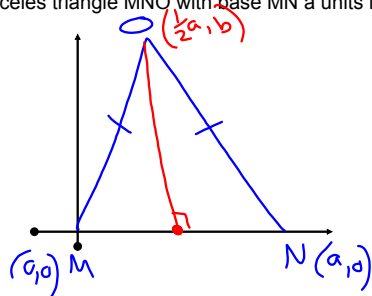
## Example 5

Right triangle XYZ with hypotenuse  $\overline{YZ}$   
 $XZ = d$  units long



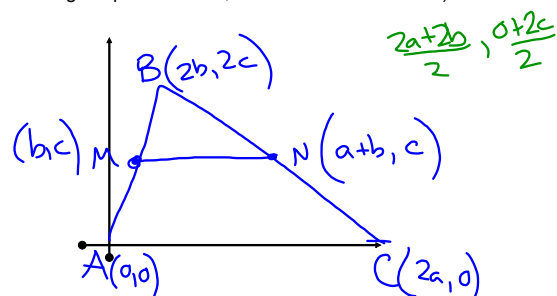
## Example 6

Isosceles triangle MNO with base  $\overline{MN}$  a units long



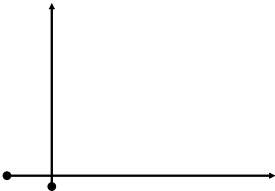
## Example 7

A line segment,  $\overline{MN}$ , joins the midpoints of 2 sides of  $\triangle ABC$   
 (When using midpoint formula, then use even numbers.)



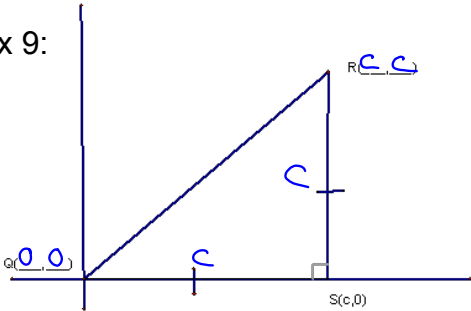
Example 8

Isosceles triangle ABC (legs  $\overline{AB}$  with midpoint M, and  $\overline{CB}$  with midpoint N)



Fill in the missing coordinates.

Ex 9:



Ex 10:

